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**The Webster  
System**  
*OF STEAM HEATING.*

WARREN WEBSTER & CO.  
EXHAUST STEAM SPECIALISTS.

## There is Pleasure

 in the possession of any really good article,  
and particularly when it represents a paying  
investment. 

The "Webster" { "Vacuum" Feed-Water Heater and Purifier,  
System of Steam Heating, . . . .

 enjoy such a classification, established by the  
experience and testimony of the many hundreds  
of users. 



WILLIAM W. MORGAN,

PHILADELPHIA MANAGER,

637 BOURSE BUILDING.

REPRESENTED BY WM. W. MORGAN JR.



WARREN WEBSTER & CO., MAIN OFFICE AND WORKS, CAMDEN, N. J.

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## Introductory.



The users of steam power throughout the United States, owing to its extensive adoption and descriptive literature largely circulated, are generally familiar with the Vacuum System of Steam Heating. Extensive and exclusive improvements have been incorporated and are herein explained.

The original patent or foundation of the system is now owned by us, and after having been subjected to exceptional litigation, no question exists as to the strength and validity of the claims covering the system as erected by us, as a number of decisions have been rendered in the United States Courts sustaining it in every case.

In presenting for consideration a refinement of the system as heretofore applied, whereby is secured thorough control as well as a more economical and efficient use of either exhaust or live steam for heating and drying purposes, we feel that these improvements will be recognized as the outcome of years of study and experience in the practical adaptation of the system through a large and varied scope of service.



WARREN WEBSTER & CO.

# ANNOUNCEMENT



## The Webster System of Steam Heating

... Is Owned and Operated Exclusively by ...



WARREN WEBSTER & CO.,

Constructed as herein described, under letters patent No. 256,089 (identified as the Williames Vacuum System) and

No. 454,964

“ 464,946

“ 526,754

“ 529,029

“ 556,562

“ 564,791

COVERING

ATTACHMENTS,  
COMBINATIONS  
AND  
IMPROVEMENTS  
THEREOF.

Pat. No. 256,089  
sustained in U. S.  
Circuit Court.

Eastern District of New York, February, 1890  
Eastern District of Penna., September, 1891  
Eastern District of Penna., December, 1894

NOTE:—Fac-simile drawings and injunctions in matter of infringing apparatus furnished upon request.

## ANNOUNCEMENT— *Continued.*

### The Webster "Vacuum" Feed-Water Heater and Purifier.

*Illustrated on page 25.*

A recognized factor for an economical steam service, and independently recognized for exclusive efficiency—explained by separate pamphlet. Its adaptation to the Webster System of Steam Heating possesses manifold advantages, among the most important being that the heater is not a "thoroughfare" through which the steam is passed, causing saturation before the steam is taken to the heating mains.

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**NOTE**—The combination of the Webster System of Steam Heating and the Webster "Vacuum" Feed-Water Heater and Purifier, effects the greatest efficiency possible to acquire under given conditions.

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**NOTE**—Having associated with us the services of competent engineers and representatives throughout the United States, we are prepared to make an examination of steam plants, to determine the measure of advantage to be derived by the adoption of the system, and to present for consideration, a proposition relative to cost, complete. The adoption and use of the system will effect economy, according to local conditions, varying from 20 to 100 per cent. per annum on the investment.

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**NOTE**—Plans and specifications can be arranged for, either as to the application of the system—or feed-water heater, in connection with new buildings—or to change existing steam heating plants under the "Webster" system, as explained by reference to page 14.

## General Considerations.

1. "Gravity," or "Back Pressure" System.
2. Air Line and Attachments.
3. "One" and "Two" Pipe Systems.

The  
Proposition  
by Others.

1. Heating Practice, for the utilization of exhaust steam for heating buildings, whether direct, indirect or both, (aside from the Webster System of Steam Heating) is confined to the "back pressure" or "gravity" method. This contemplates by necessity a pressure at the inlet or supply main to the system, the limit of this initial pressure being governed primarily to induce a thorough circulation,—to overcome the resistance arising from the accumulation of air and water of condensation, and to insure a constant steam supply as rapidly as condensation occurs. The range of back pressure, therefore varies, according to local conditions from one to five pounds or more.

Where One  
Factor of  
Economy is  
Lost.

Back pressure upon the engine requires no comment, as it involves additional steam consumption or work, the mean effective pressure upon the engine piston being reduced. Other than the commercial consideration of expense, incident to heating by back-pressure, well known objections to its operation could be emphasized, including the familiar "water hammer," frequent leaks and imperfect circulation.

## Familiar Objections.

It is contended that these objections are minimized by proper piping of large size, and great stress has been laid upon this point. While it is admitted the size and arrangement of piping in a measure bears upon the correction of "back-pressure" to induce an efficient circulation, it still remains that the cost of installation—of heating and maintenance is a constant factor. Ordinary air valves of different designs are frequently employed to assist the circulation. These permit the foul air contained in the coils, etc., to escape into the rooms. Many forms of air valves require hand manipulation, and if improperly operated, permit steam to escape, and frequently damage to goods or building.

Note the advantages of the Webster System of Steam Heating, compared with the foregoing method.

## Proposed Improvements by Removal of Air, with Explanations.

2. Combining the Gravity system with improvements, it has been proposed to connect the ordinary air valves to the top or upper portion of the radiator, with an independent air pipe in addition to the supply and return pipes, (for the purpose solely of removing the air from the radiators); the various air pipes from each radiator or coil of the system are connected to a general air main, or pipe leading to the basement, to which an "exhausting attachment" is connected. In such apparatus the water of condensation does not pass through these air valves into the additional air pipe, but flows back by gravity through the ordinary returns, whether in a single or double pipe system. By means of the "exhausting attachment" connected as explained, a partial vacuum is effected within the air lines, to act upon the





**Comments,  
Self  
Explanatory.**

air valves referred to. Such apparatus is effective only in removing the air from the radiators in first starting the system. If all the air is not drawn out, or if any air subsequently collects, the tendency of the expanding steam rising in the pipes of the radiator is to displace or force the air to the bottom, so that it cannot, without the loss of steam, reach the air valves and be discharged. Imperfect air removal as explained, interferes materially with the circulation of the steam, and affects the efficiency of the radiating surface. Another objection is suggested from the fact that the partial vacuum due to the "exhauster" enters the radiators, retarding the natural gravity flow of the condensation in the return pipes, and as a consequence water from the return pipe is drawn into the radiators, or steam will back up by a reverse circulation. To prevent this difficulty of operation check valves are introduced into the return pipe from each radiator or coil. The operation is therefore, to be successful, intermittent, and there is a consequent loss of steam through the air line. The steam required for the operation of the "exhauster" is necessarily wasted to the atmosphere, as it is intermingled with the air from the heating system. Furthermore, to save the condensation from the heating system, independent means are necessary—usually a pump and receiver.

3. A further objection to this method lies in the fact that when employed with the ordinary two-pipe system it necessitates the use of a separate and additional set of pipes (making it a three-pipe system); if used on a

**Saturation of  
Steam where a  
"One-Pipe"  
System is used;**

**Disadvantages.**

**The Webster  
Improvement.**

single pipe system, the return of the water of condensation down the same pipe through which the steam is supplied to the radiators, etc., causes a saturation of the steam and a partial condensation, with a resulting lowering of temperature and waste of heat units. One decided disadvantage of a one pipe system arises in practice, owing to the struggle for "right of way" between the steam and water through the same opening. Should the valve upon a radiator be improperly closed or leak, the radiator will condense itself full of water, due to the partial vacuum by condensation, and upon opening the valve water hammer results for a period of ten to twenty minutes before the water has found exit, and the normal conditions regained.

For buildings that cover considerable area of ground, it is in general impracticable, as the necessary fall for the condensation is absent—for a complete system in the saving of the condensation, and the satisfactory working of the plant as an entirety.

**NOTE.**—This system as outlined possesses merit compared with the gravity or pressure system, but is limited in efficiency, scope of advantages and economy.

The Webster improvement, compared with the class of heating above described, possesses these advantages: The return line to the vacuum pump immediately transforms a one-pipe system to a two-pipe, and by the constant vacuum maintained therein, both the air and water of condensation are entirely separated from the steam supply so that there is no possible waste of steam or loss of temperature by premature condensation; this result is

**Exclusive,  
Efficiency.**

still further emphasized by the introduction of Thermostatic Air and Water Relief Valves applied to the vacuum line at the base of each coil or radiator—additional advantages of which improvement will be explained on subsequent pages. Where a two-pipe system is in operation, slight and inexpensive alterations only will be required to change to the Webster System. A third line of pipes is never required under any condition, the return line to Vacuum pump receiving both air and water of condensation, and therefore these air valves as ordinarily applied to “Air Line and attachment system” or to the “gravity or back pressure system” are entirely dispensed with.



# Advantages

## FULLY GUARANTEED.

With the Webster System of Steam Heating are fulfilled all the essential requirements for the use of either exhaust or live steam, with unequalled efficiency, and as an entirety it covers the greatest scope of advantages known for the purpose.

### 1. Regulation of Temperature.

A special and exclusive feature of operation made possible by this improved system, and which further marks an important advance in modern heating, particularly where the individual comfort of tenants or employees must be considered, is, that the entire system of radiators, or any particular one or more that may be situated in any part of the building, can be heated to a temperature less than the initial of the steam by which they are supplied. That is to say, any degree from 212° (if exhaust steam is used at atmospheric pressure) down to the temperature of the radiators due to the temperature in the room may be obtained and held as long as desired, say, for instance, 100°, 150° or 180°, without water-logging or hammering in the system and independent of the radiators that may be connected with the same supply. This adjustment, controlled by the valve on the steam supply





to each radiator together with the Thermostatic action of the air and water relief valve on the return end, combines the same advantages for steam heating as those derived by the hot water system in regulating the degree of warmth to that required for comfort, according to the weather, a result in steam heating that cannot be accomplished by any other known method. This is effected by maintaining a vacuum in the respective radiators to any degree that may be desired, by which the normal temperature of the steam is reduced to that of the degree of vacuum maintained in the radiator, and may be properly called the improved vapor system.



This regulation of uniform temperature is maintained, until such time as the steam valve to the radiator is changed, either to a greater or reduced opening, so that the temperature and comfort of each room, (other conditions of heating surface, etc., being correct), is in direct control of the occupants. (By a single valve.)



## 2. Cost of Installation,

inclusive of rights conferred for the use of the system and necessary apparatus, is less than any other system for any building of considerable size.

## 3. The Exhaust Steam from Engines, Pumps, etc.

will flow into the heating mains, more freely than to the atmosphere.



#### 4. The Maintenance within the Return or Drip Lines,

of the heating system of a partial vacuum—effecting removal of air and water of condensation, inducing steam circulation without initial pressure, and securing the utmost efficiency of the heating surface.

#### 5. Preventing the Waste of Water and Steam,

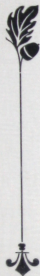
by the introduction of thermostatic valves—especially designed for the purpose, in the return pipe of each coil or radiator, automatically opening to the presence of air and water; closing to the loss of steam. A “ Vacuum ” for the operation of the system mechanically maintained without injection water, and the steam required for the operation of the vacuum pump, exhausted directly to the heating main. Operation of the system is therefore practically without cost.

#### 6. The Use of Air Valves

and independent air lines are rendered unnecessary, nor is it required to place either check or hand valves in the returns.

#### 7. Saving of Condensation

for boiler feeding or other purposes. Air and gases are liberated before condensation is discharged into boiler.



### **8. Saving of Power and Fuel.**

Due to the removal of back pressure upon the engines.

### **9. Operation and Maintenance.**

Given the circulation of exhaust steam without back pressure, and consequent saving of power and fuel; exhaust steam from the vacuum pump utilized in the heating mains or feed-water heater; the saving of expense in relation to correcting leaks, due to water hammer or freezing; attention of employees or tenants minimized to the handling of one valve, "to heat" or "shut off" each radiator; one-half the number of valves to get out of order or leak; justifies the representation established by facts that the operation and maintenance is less than any other method.

### **10. Circulation of Steam at or below the Atmosphere,**

lessens the amount of condensation per square foot of heating surface, and further avoids the usual repairs to piping occasioned by leaks, water hammer, etc.

### **11. The Same Advantages**

are equally true where low pressure live steam is used for heating, and for adaptability under all conditions of either live or exhaust steam (or both if the former is supplemented to make up a deficiency of exhaust) this improved system at once insures success, with economy for first cost, and commercially the greatest return upon the investment.

# For Steam Heating.

1. New Buildings.
2. Old Buildings Now Heated.
3. Blower System.
4. Paper Machines.



1. The system contemplates the introduction of suitable apparatus, in effect to normally maintain a partial vacuum, within the return or drip lines of the heating pipes or radiators, which according to modern practice and advantages of installation are provided with thermostatic valves (more fully explained by subsequent consideration) and by which the water of condensation and air is instantly removed. Circulation of steam throughout the system is therefore uniformly maintained, and the water of condensation utilized for boiler feeding or other use.

## (Old Buildings Now Heated.)



2. For the introduction of the Webster System of Steam Heating, to premises already equipped with a steam heating system (ordinarily known as the "gravity" or "back-pressure" method), attention is particularly invited to the fact that no material change of the piping is *necessary*, except at the connections in the basement for the introduction of apparatus explained; the only change required to render the existing piping as efficient as the most modern equipment involves the substitution of our patented thermo-





static attachment, to the body of the return valve already on piping, substituting our attachment in place of the original valve mechanism. This change simply requires the removal of these parts, leaving the valve body and piping intact, and we furnishing in their place the thermostatic attachment named. Each valve or coil is thus provided with a thermostatic valve, in effect the same as if extensive changes were made to the entire system, for the introduction of new valves.

### 3. Blower Systems.

For heating systems used in combination with a blower or suction fan which forces or moves heated air through ducts, pipes or flues, the same general advantages are repeated as contained by pages 10 to 13.

### 4. For Paper Machines.

The Webster System is especially recognized for merit, when installed in service with the drying cylinders of paper machines, steam drums, etc., as the constant and absolute removal of the water and air, effects greater output and better quality of product. Particulars and endorsements for such installations will be gladly furnished.

**NOTE.**—The Webster System of Steam Heating is equally adapted for steam circulations in drying rooms, or in general for any purpose.

# Thermostatic Water and Air Relief Valves.

## .... These Improvements ....

are designed primarily to produce a more perfect circulation of steam in any type of heaters employed—to render the apparatus self-controlling, to cheapen the cost of construction by enabling smaller mains and returns to be used, and to

## Prevent Waste of Steam or Water.

In carrying out these improvements, thermostatic valves are introduced in the returns or in the outlets from the heaters to the returns, which permit the air and water to be drawn out of the heaters, but prevent the discharge of steam, so that the waste of steam through the returns and the “possible short circuiting” of the circulation is effectively prevented.

With an ordinary system of piping, such as is usually employed in buildings and factories, some of the lines leading from the supply pipe to the main return are necessarily shorter than others, and for a given amount of vacuum, which may be necessary to induce a proper circulation through the lines of greater length, there will be an excessive suction on the shorter lines, which, unless proper precautions are taken to prevent it, will be liable to produce “short circuiting” or the circulation of an excess of steam through the shorter lines, with a deficiency through the longer. This, if permitted, would cause a waste of steam, and a more or less defective circulation.





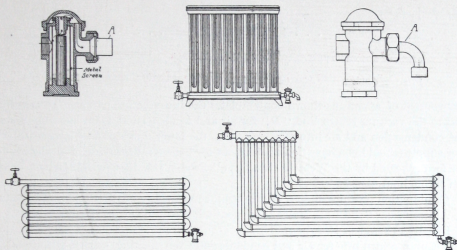
To prevent this short circuiting, it has been usual to adjust the valves in the various returns so as to throttle them to a greater or less extent, and thus properly regulate the suction through the different lines. This necessitates the use of hand valves, and requires the attention of the engineer. It also necessitates the various returns to be preferably grouped together so as to be within reach.

These difficulties are avoided by rendering the apparatus automatic or self-adjusting and by effectually preventing the waste of steam. To this end there is placed in each return pipe or in the connection thereof to the various heaters, or in the outlet from the heaters, an automatic or thermostatic valve, especially designed for the above purpose, which will operate to close the outlet to the return pipe when steam reaches it, but under other conditions will remain open. Such thermostatic valves are well known, and have usually been used on radiators, located on the upper portion thereof, to permit the escape of air until the radiator fills with steam. Such valves are not used to receive water, but are usually constructed to prevent the discharge of water under any conditions. As used by us, however, these valves are so arranged that any air or water that may be present in the radiator or heating coil will be sucked or drawn out by the partial vacuum in the return pipe, without loss of steam, for the moment the steam reaches the valves they are immediately closed by the thermostatic action, and remain closed until air or water is again present. In this way the heaters are kept free from air or water by the partial vacuum in the return line, and

the water of condensation together with the air thus drawn off is sucked into the return main and discharged by the vacuum pump or other means, determined by local conditions. As the thermostatic valves effectually prevent the passage of steam into the returns, there is no possibility of "short circuiting" in any of the lines, and an equable circulation is thus obtained throughout the various portions of the system without the necessity of manipulating any hand valves.

The arrangement of piping is also simplified, as it is not necessary to group the various returns, or to form them in batteries, so as to render their valves accessible to the engineers; nor is it necessary to employ these usual hand valves in the returns.

Another advantage accruing from this improvement, is that smaller returns and return mains are enabled to be used than is possible where the steam and water flows through them, because where the returns receive only the water of condensation and air, smaller cubical capacity is required than is necessary where, in addition to air and water, steam and vapor must be also received. Another reason that smaller returns may be used, as above referred to, is that the design of the thermostatic valves act to catch or separate from the water of condensation the dirt or sediment which otherwise would pass into the return pipes and produce clogging if small pipes were used. The dirt or sediment thus collected can be readily discharged therefrom by a removable bottom cap furnished in the construction of the valve.



#### THE WEBSTER SYSTEM OF STEAM HEATING.

**Samples of heating apparatus showing attachment of thermostatic Water and Air Relief Valves.**

NOTE.—"A." Vacuum return line for air and condensation.

NOTE.—The action of the thermostatic valve is positive; being controlled by the differences in temperature between the steam, water and air.

NOTE.—Design of the thermostatic valve not confined to that illustrated.



**The Webster System of Steam Heating.**

**The Webster "Vacuum" Feed-Water Heater and Purifier.**

Arrangement of apparatus shown contemplates the introduction of a special vacuum pump, connected to the vacuum return line "D" for air and condensation from heating system ; discharge of condensation and air into receiving tank, the latter provided with automatic control of city water supply (should condensation be deficient for boilers ;) the saving of all the condensation for boiler feed reheated by the Webster "Vacuum" Feed-Water Heater and Purifier, by automate operation throughout.

- A.* Combination pressure and vacuum gauges, connected to heating main and vacuum pipe.
- B.* Atmospheric Ball Check Valve to prevent admission of air to heating system.
- C.* By-pass to sewer or elsewhere.
- D.* Vacuum return line for air and condensation from heating system ; optional whether above or below floor level.
- E.* Overflow and air discharge from tank.
- F.* Exhaust from pump to heating system.
- G.* To boiler feed pump.
- H.* To drain.

NOTE.—Modifications of arrangement are determined by requirements or convenience.

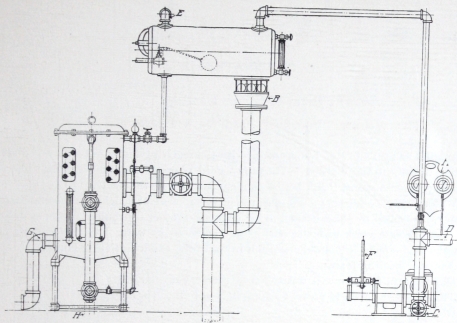


PLATE 1.



. . . COMBINATION OF . . .

**The Webster System of Steam Heating.**

**The Webster "Vacuum" Feed-Water Heater and Purifier.**

Explanation as by Plate No. 1, dispensing with the receiving tank as shown, and discharging condensation directly to the Webster "Vacuum" Feed-Water Heater and Purifier; liberation of air and gases effected at point "A" before condensation enters the heater.

*B.* Water supply to heater for summer use or to supplement deficiency of condensation for boiler supply, controlled by valve located in boiler room or other convenient place, as desired.

*C.* Balance steam valve to boiler feed pump, actuated by water level in heater; prevents waste of water and effects automatic operation in returning condensation to boilers.

*D.* Assumed heating mains.

*E.* Direct steam from boilers, controlled by pressure regulator.

*F.* Back pressure valve, to prevent atmosphere entering heating mains.

*G.* Oil Separator.

**NOTE :—**Modifications of arrangement are determined by requirements or convenience.



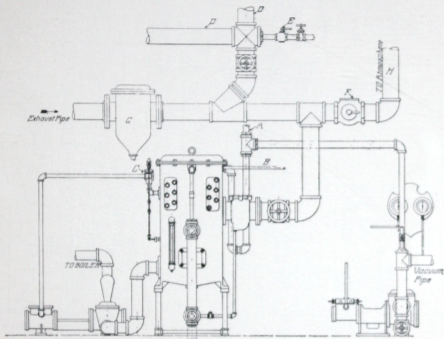


PLATE 2.

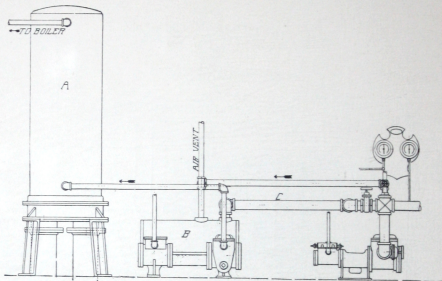


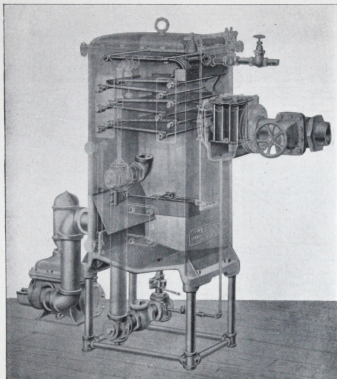
PLATE 3.

The Webster System of Steam Heating, explained as by Plate 1, in connection with tubular heater, "A" assumed to be in service at time of installation.

Condensation from heating system, discharged into pump and receiver "B" thence automatically through tubular heater to the boilers.

"C" By-pass for direct steam, arranged for night service.

**NOTE:—Modifications of arrangement are determined by requirements or convenience.**



THE WEBSTER "VACUUM" FEED-WATER HEATER AND PURIFIER.  
Interior Construction, Copper and Brass.

Separate Pamphlet explains entire considerations.



OTHER than the hundreds of past installations of the "Vacuum" System of Steam Heating under the original patent, (involving difficulties of operation as considered under improvements on pages 16 to 18), the following installations are mentioned of the Webster System of Steam Heating, of which the improvements therein referred to are the basis of adoption :

The Geo. Tritch Hardware Co., . . . . .	Denver,	Colo.
The American Ordnance Co., . . . . .	Bridgeport,	Conn.
The Bridgeport Gun Implement Co., . . . . .	"	"
The Peck, Stow & Wilcox Co., . . . . .	East Berlin,	"
The Pope Mfg. Co., . . . . .	Hartford,	"
The Hartford Rubber Co., . . . . .	"	"
Pope Mfg. Co. Extension, . . . . .	"	"
Hartford Cycle Co. Extension, . . . . .	"	"
The L. Candee Co., . . . . .	New Haven,	"
The Winchester Repeating Arms Co., . . . . .	" "	"
The American Hosiery Co., . . . . .	New Britain,	"
The Peck, Stow & Wilcox Co., . . . . .	Southington,	"
Messrs. Cheney Bros., . . . . .	So. Manchester,	"
The Excelsior Needle Co., . . . . .	Torrington,	"
The H. L. Judd Co., . . . . .	Wallingford,	"
The Southern Furniture Co., . . . . .	Atlanta,	Ga.
McCoy's Hotel, . . . . .	Chicago,	Ills.
Hotel Del Prado, . . . . .	"	"
The Chicago Edison Co., . . . . .	"	"

The E. J. Lehman Estate Bldg., . . . . .	Chicago,	Ills.
Western Wheel Works, . . . . .	"	"
West Chicago Street Railway, . . . . .	"	"
The Penna. R. R. Co., (Union Depot), . . . . .	"	"
Messrs. Ogden, Shelden & Co., . . . . .	"	"
Chas. Kaestner & Co., . . . . .	"	"
The Adams & Westlake Co., . . . . .	"	"
Messrs. A. M. Rothchild & Co., . . . . .	"	"
The Illinois Watch Case Co., . . . . .	Elgin,	"
The St. Louis Stamping Co., . . . . .	Granite City,	"
The Illinois State Penitentiary and Female Prison, . . . . .	Joliet,	"
The Pullman Palace Car Co., . . . . .	Pullman,	"
The Town of Pullman, . . . . .	"	"
Plano Mfg. Co., . . . . .	West Pullman,	"
The Rockford Mitten & Hosiery Co., . . . . .	Rockford,	"
The Bates Mfg. Co., . . . . .	Lewistown,	Me.
The Parker House Extension, . . . . .	Boston,	Mass
The Boston Rubber Shoe Co., . . . . .	"	"
The Inverness Apartment House, . . . . .	"	"
Boston Rubber Shoe Co., (Old System), . . . . .	"	"
The H. P. Marshall Shoe Co., . . . . .	Brockton,	"
The Brockton Power Bldg., . . . . .	"	"
The Central Oil Gas Stove Co., . . . . .	Florence,	"
J. Otis Marshall, . . . . .	Lynn,	"
J. B. Renton, . . . . .	"	"
The National Photo. Paper & Chem. Co., . . . . .	Springfield,	"
National Needle Co., . . . . .	"	"
The State Mutual Life Insurance Co., . . . . .	Worcester,	"
G. W. Gail & Ax, . . . . .	Baltimore,	Md.
H. F. Miller & Son, . . . . .	"	"
The Diamond Match Co., . . . . .	Detroit,	Mich.

The Wm. Barr Dry Goods Co.,	St. Louis,	Mo.
Swift & Co.,	Kansas City,	"
The St. Charles Hotel,	Atlantic City,	N. J.
Tiffany & Co.,	Forest Hill,	"
Messrs. Heller Bros.,	" "	"
Janeway & Co.,	New Brunswick,	"
Court House and Jail Bldgs.,	Freehold,	"
The Schoelkopf Analine & Chem. Co.	Buffalo,	N. Y.
"The Lenox,"	"	"
Chas. T. Bainbridge & Son,	Brooklyn,	"
Robert Gair,	"	"
The Pratt Institute,	"	"
The Bowling Green Bldg.,	New York,	"
The La Rochelle Apartment House,	" "	"
The Baptists Home Bldg.,	" "	"
The Silk Exchange Bldg.,	" "	"
The Syndicate Bldg.,	" "	"
The Lord's Court Bldg.,	" "	"
Howe & Hutten Bakery,	" "	"
Bldg. B'way and White Street,	" "	"
The Diamond Match Co.,	Oswego,	"
The Sidney B. Roby Bldg.,	Rochester,	"
The American Fire Engine Co.,	Seneca Falls,	"
The North Carolina College of Agriculture & Mechan. Arts,	Raleigh,	N. C.
The Pilot Cotton Mills,	"	"
The Lakeside Hospital Bldg.,	Cleveland,	O.
The Paige Car Wheel Co.,	"	"
The Standard Sewing Machine Co.,	"	"
The New Bremen Woolen Mills,	New Bremen,	"
The Diamond Match Co.,	Barberton,	"
W. H. Grundy & Co.,	Bristol,	Pa.

**L**IST covering installations of the Webster System of Steam Heating since date of publication of pamphlet—October, 1896.

### CONNECTICUT.

Norwich Bleaching Dyeing & Printing Co., Norwich.  
 D. E. Whiton Machine Co., . . . . . New London.  
 Landers, Frary & Clark, . . . . . New Britain.  
 Plume & Atwood Manufacturing Co., . . Waterbury.  
 Grosvenor Dale Co., . . . . . North Grosvenor Dale.  
 Plumb & Winton Co., . . . . . Bridgeport,  
 Fairchild & Shelton, . . . . . Bridgeport,

#### Architects.

#### Heating Contractors.

L. H. Mills.  
 L. H. Mills.

### COLORADO.

Colorado Springs Rapid Transit Co., . . . Colorado Springs.

### DELAWARE.

Delaware Glue Works, . . . . . Newport Road.  
 The W. B. Clerk Co., . . . . . Wilmington.  
 The B. F. Shaw Co., . . . . . Wilmington.

B. F. Shaw Co.  
 B. F. Shaw Co.

### DISTRICT OF COLUMBIA.

Chesapeake & Potomac Telephone Co., . . Washington.

### GEORGIA.

Gould Building, . . . . . Atlanta.  
 Austell Building, . . . . . Atlanta.  
 Macon Knitting Co., . . . . . Macon.

E. C. Chapman.

G. W. Glaskin & Co.  
 G. W. Glaskin & Co.

# ILLINOIS.

Meyer Building,	Chicago.
Swift & Co.,	"
Seltz, Schwab & Co.,	"
David Bradley Manufacturing Co.,	"
Ames & Frost Company,	"
Royal Insurance Co.,	"
Chicago & N. W. Railway Co.,	"
Monarch Cycle Co.,	"
Alexian Bros. Hospital,	"
Geo. M. Clark & Co.,	Harvey.
Joliet Manufacturing Co.,	Joliet.

# KENTUCKY.

The Marsden Co.,	Owensboro.
------------------	------------

# NEW JERSEY.

Jersey City Printing Co.,	Jersey City.
Manhattan Building,	"
John Lucas & Co.,	Lucaston.
Hewes & Phillips Iron Works,	Newark.
A. F. Bannister,	"
Clark Thread Co.,	"
Stirling Silk Manufacturing Co.,	"

# NEW HAMPSHIRE.

I. B. Williams & Son,	Dover.
-----------------------	--------

# NORTH CAROLINA.

Jonesboro Cotton Mill,	Jonesboro.
------------------------	------------

## Architects.

D. Adler & Son.

D. Adler & Son.

Jenney & Mundie.

## Heating Contractors.

Kehm Bros. & Mertz.

Kehm Bros. & Mertz.

Thomas & Smith.

Kehm Bros. & Mertz.

Thomas & Smith.

Russell & Gorman.

Jas. McWilliams & Co.

W. W. Farrier.

Francis Bros. & Jellett.

A. B. Franklin.



## NEW YORK.

Cousins Shoe Factory, . . . . .	Brooklyn.
Jones Bros. Coffee Factory, . . . . .	"
School No. 37, . . . . .	Buffalo.
Gifford Bros., . . . . .	Hudson.
Bible House, . . . . .	New York City.
Central Syndicate Bank, . . . . .	"
P. R. R. Co., 23d St. Ferry House, . . . . .	" "
E. C. Fisher & Co., . . . . .	Salamanca.
Firth Carpet Co., . . . . .	West Cornwall.

## MASSACHUSETTS.

Hotel Tournaine, . . . . .	Boston.
Boston Rubber Shoe Co., . . . . .	"
West End Street Railway Co., . . . . .	"
Block Plant Electric Light Co., . . . . .	"
Bulfinch State House, . . . . .	"
Lamb Manufacturing Co., . . . . .	Chicopee Falls.
American Rubber Co., . . . . .	East Cambridge.
Lenox & Briggs, . . . . .	Haverhill.
Dutcher Temple Co., . . . . .	Hopedale.
H. A. & G. K. Pevear, . . . . .	Lynn.
Mawhinney Last Company, . . . . .	Monticello.
Dennison Manufacturing Co., . . . . .	S. Framington.
P. H. Potter, . . . . .	Springfield.
Samson Cordage Works, . . . . .	Shirley.
L. D. Thayer Manufacturing Co., . . . . .	Worcester.
McKay Metallic Fastening Association, . . . . .	Winchester.

### Architects.

Wm. Nibby.

Jno. T. Williams.

### Heating Contractors.

Johnson & Morris.  
Irlbacker & Son.

Gillis & Geoghegan.  
Blake & Williams.  
{ Onderdonk Heating  
& Vent'g Co., Phila.

Winslow & Witherill

Ingalls & Kendrick

{ Walker & Pratt  
Manufacturing Co.  
A. A. Sanborn.

Collyer Machine Co.  
T. B. Reardon.  
Churchill & Washburn  
Nutter & Seabury,

# MISSOURI.

Liggett & Myers Tobacco Co., . . . . . St. Louis.  
Fullerton Building, . . . . . "

# MAINE.

S. D. Warren & Co., . . . . . Cumberland Mills.  
Forrest Paper Co., . . . . . Yarmouthville.

# MONTANA.

Anaconda Copper Mining Co., . . . . . Anaconda.

# MICHIGAN.

Dayton Last & Block Works, . . . . . Gaylord.

# OHIO.

Patterson-Sargeant Co., . . . . . Cleveland.  
The Sherwin Williams Co., . . . . . "  
Goodrich Building, . . . . . "  
H. P. Nail Co., . . . . . "  
Union Depot, . . . . . Columbus.  
Crane & Breed Manufacturing Co., . . . . . Cincinnati.  
Riverside Malting and Elevator Co., . . . . . "  
Baldwin Piano Co., . . . . . "  
Chatfield & Woods Co., . . . . . "  
Stoddard Manufacturing Co., . . . . . Dayton.  
Oakwood Street Power House, . . . . . "  
Y. M. C. A. Building, . . . . . "  
Hayner Distilling Co., . . . . . "  
U. B. Publishing Co., . . . . . "  
Procter & Gamble Co., . . . . . Ivorydale.

# Architects.

W. Albert Swasey.

# Heating Contractors.

Hughes & Stone.

. . . . . Cleveland S.F. & S. Co.  
{ Coburn, Barnum, Schaffer & Becker.  
{ Benes & Hubbell. Cleveland S.F. & S. Co.  
. . . . . Thomas & Smith.  
  
. . . . . M. J. Gibbon.  
. . . . . M. J. Gibbon.

The Physicians & Dentists Bldg., . . . . .	Philadelphia,	Pa.
Hotel Aldine, . . . . .	"	"
The Widow's Home, . . . . .	"	"
The John Dobson Bldg., . . . . .	"	"
The Atlantic Refining Co., . . . . .	"	"
The Onderdonk Heating & Vent. Co., . . . . .	"	"
The Bullitt Bldg., . . . . .	"	"
Wm. P. Datz & Bro., . . . . .	"	"
J. & J. Dobson Mills, . . . . .	"	"
The Paris Laundry Annex, . . . . .	"	"
The American Baptist Pub. Society, . . . . .	"	"
Walker & Linde Bldg., . . . . .	"	"
S. S. White Dental Mfg. Co., . . . . .	"	"
Deewalt & Eisenhardt Machine Shops, . . . . .	"	"
The Phipps Bldg., . . . . .	Pittsburg,	"
The Lehigh Zinc & Iron Co., . . . . .	South Bethlehem,	"
Bethlehem Silk Co., . . . . .	"	"
Roaring Springs Blank Book Co., . . . . .	Roaring Springs,	"
The Edison Electric Light Co., . . . . .	Williamsport,	"
The Collyer Machine Co., . . . . .	Pawtucket,	R. I.
The Newport News Shipbuilding & Dry Dock Co., . . . . .	Newport News,	Va.
The Tredegar Iron Works . . . . .	Richmond,	"
The Leitch Pump & Machine Works, . . . . .	"	"
The Crawford Woolen Co., . . . . .	Martinsburg,	W. Va.
The Kilbourn Knitting Machine Co., . . . . .	"	"
The Badger Paper Co., . . . . .	Kaukauna,	Wisc.
The Nekoosa Paper Co., . . . . .	Nekoosa,	"
The Diamond Match Co., . . . . .	Oshkosh,	"
The Empire Tobacco Co., . . . . .	Granby, Quebec, Canada.	
Plant Steam Ship "La Grande Duchesse," . . . . .	{ Built by Newport News Shipbuilding & Dry Dock Co.	



## SPECIAL NOTE.

Upon the following pages are reproduced a number of buildings that are\* equipped with

**The Webster System of Steam Heating.**

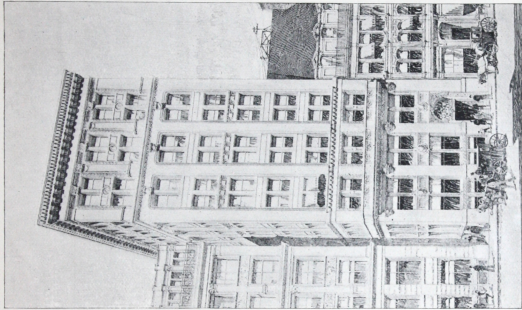
**The Webster "Vacuum" Feed-Water Heater and Purifier.**

These cuts although limited in number, serve to illustrate the class of Office Buildings, Factories, Hotels, Apartment Houses, Etc., for which the combination system has been adopted.

For additional variety of business and manufacture, it is suggested to examine the list of users, pages 26 to 29.

**\*In several instances the installations are not complete at the date of this pamphlet (Oct. '96), but are included in this issue as the work is now in progress.**

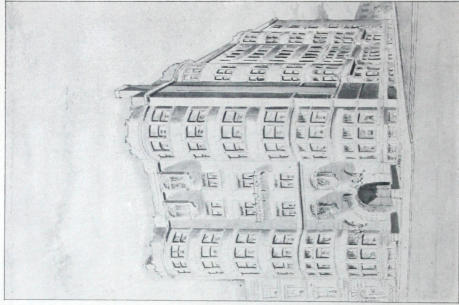




Walker Pratt Mfg. Co.  
Heating Engineers  
and Contractors,  
Boston, Mass.

**MASSACHUSETTS BUILDING.**  
No. 60 State Street,  
Boston, Mass.

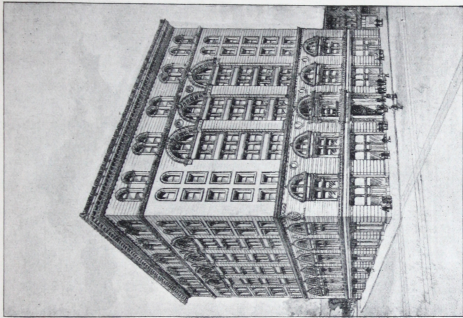
Cabot, Everett & Meade,  
Architects,  
Boston, Mass.



Heating Engineers  
and Contractors,  
Arthur & Shaw,  
Boston.

"THE INVERNESS."  
859 Beacon St.  
Boston.

Arthur H. Bonditch,  
Architect,  
Boston.



Ingalls & Kendrick,  
Heating Engineers  
and Contractors,  
Boston, Mass.

State Mutual Life Assurance Co. Building, Peabody & Stearns,  
Architects,  
Boston.  
Worcester, Mass.

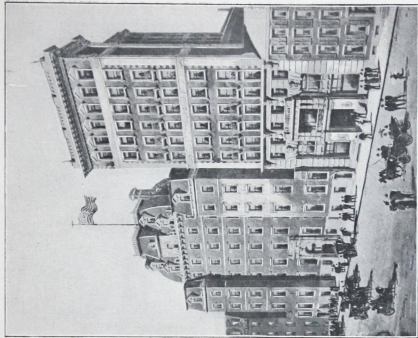


Architect,  
Henry Ives Cobb,  
Chicago.

RUSSELL BUILDING, CHICAGO, ILLS.

Heating Contractors,  
Maginn, Bradley & Co.,  
Chicago.

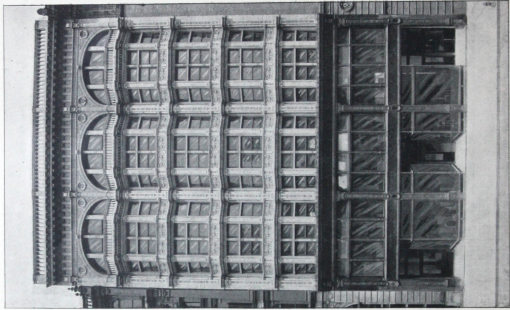




Thompson Bros.,  
Heating Contractors,  
Phila.

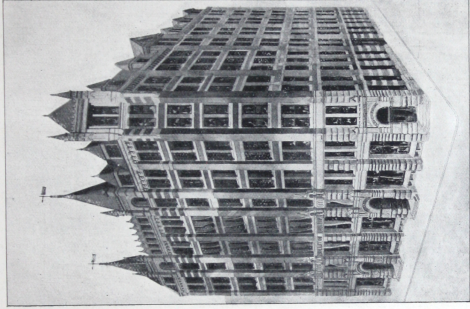
HOTEL ALBINE,  
Phila., Pa.

Dr. W. A. Drysdale,  
Consulting  
Engineer.



John Dobson, Owner.  
Chas. McCaul,  
Architect and Contractor.

JOHN DOBSON BUILDING,  
Heating Engineers & Contractors,  
Phila., Pa.



Jay M. Whitham, M. E.  
Consulting  
Engineer.

**BULLITT BUILDING,**  
Phila., Pa.

Changed over to the Webster System.

Kline & Co.,  
Heating Contractors,  
Phila.

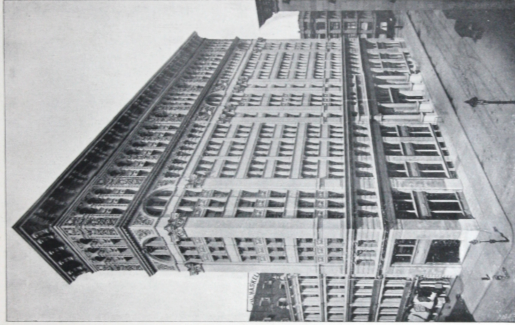


P. Gormly,  
Heating Contractor,  
Phila., Pa.

HOTEL ST. CHARLES,  
Atlantic City, N. J.

Dr. W. A. Drysdale,  
Consulting Engineer,  
Phila., Pa.

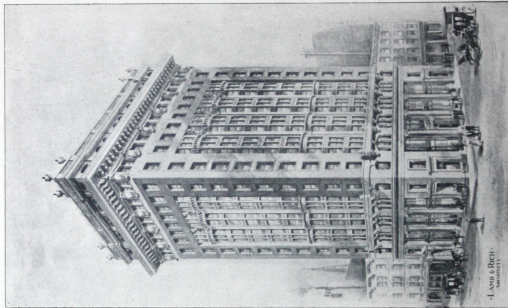
Subsequent orders from J. T. Williams, resulting from these installations:—Lord's Court Building and Broadway and White Streets Building, N. Y.



J. T. Williams,  
Architect and Owner,  
Chief Engineer,  
R. G. Davis,

"SILK EXCHANGE,"  
B-way and Broome Sts.,  
N. Y.

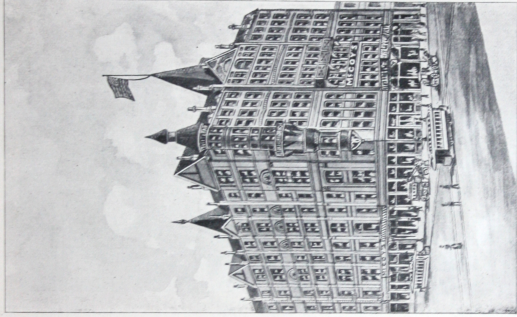
Blake & Williams,  
Heating Engineers and  
Contractors,  
N. Y.



R. P. Bolton, C. E.,  
Consulting Engineer.  
J. W. Jackson,  
Chief Engineer.

**SYNDICATE BUILDING,**  
Liberty and Nassau Streets,  
N. Y. City.

Blake & Williams,  
Heating Engineers and  
Contractors,  
N. Y.



Wm. McCoy,  
Owner and Proprietor.

McCOY'S  
New European Hotel—Chicago.

Russell & Gorman,  
Heating Engineers and  
Contractors,  
Chicago.



Englehart & Stott Co.,  
Heating Engineers  
and Contractors.

HOTEL DEL PRADO, Chicago, Ill.

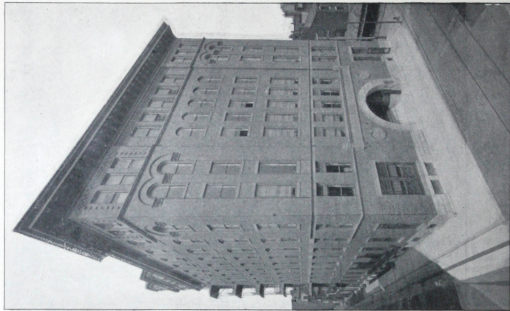




Hales & Ballinger,  
Architects.  
Chas. McCaul,  
Contractor.

CALEB J. MILNE BUILDING.  
10th St. & Washington Ave.,  
Philadelphia, Pa.

Jay M. Whitham, M. E.,  
Consulting Engineer.  
S. Faith & Co.,  
Heating Contractors.



Hales & Ballinger,  
Architects & Engineers,  
Phila.

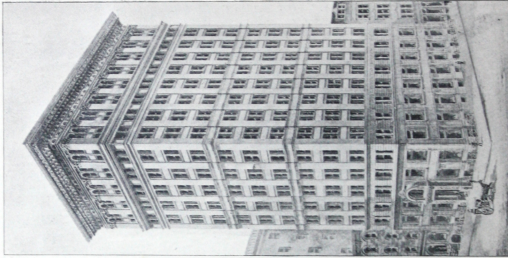
American Baptist Publication Society,  
Juniper and Lombard Sts.,  
Phila., Pa.

S. Faith & Co.,  
Heating Contractors,  
Phila., Pa.



Davis & Gorman,  
Heating Engineers and Contractors,  
Chicago.

A. M. ROTHSCHILD & CO.,  
Chicago.



J. T. Williams,  
Architect and Owner.  
R. P. Bolton, C. E.,  
Consulting Engineer.  
R. G. Davis,  
Chief Engineer.

**LORD'S COURT BUILDING,**  
Exchange Place and Williams Street,  
New York City.

Blake & Williams,  
Heating Engineers and  
Contractors,  
N. Y.



Owner,  
Sidney B. Roby,

ROBY BUILDING,  
Rochester, New York,

47

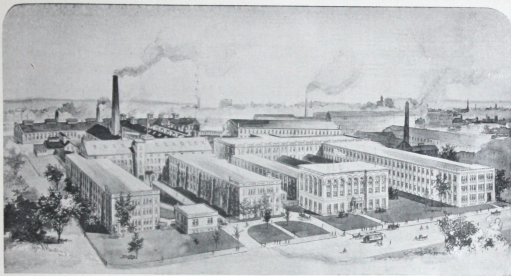
Barr Bros.,  
Heating Contractors,  
Rochester, N. Y.



CARTRIDGE DEPARTMENT,

Winchester Repeating Arms Company—New Haven, Conn.

Webster System, circulating exhaust steam from central plant, through 22,000 sq. ft. heating surface in the buildings shown.



POPE MANUFACTURING CO.,

Columbia Cycle Works, Hartford, Conn.

Webster System applied to six Sturtevant Blowers, heating entire plant.



Loverin & Whelan,  
Architects,  
Buffalo.

"THE LENOX"—APARTMENTS.  
Buffalo, N. Y.

Niagara Furnace Co.,  
Heating Engineers and Contractors,  
Buffalo, N. Y.

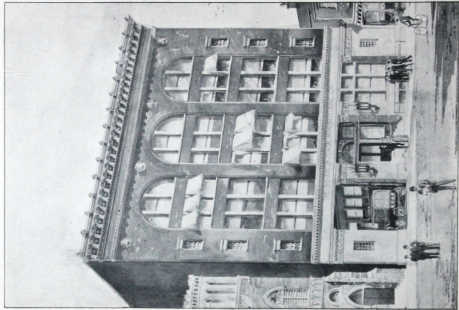




POPE MANUFACTURING CO.,

Hartford Rubber Works Co., Hartford, Conn.

Heated by Webster System of Steam Heating, Direct and Indirect Radiation.



Boyd & Boyd  
and Spencer Roberts,  
Associate Architects.

S. S. White Dental Manufacturing Co.,  
Heating Contractors,  
Phila., Pa.

S. Faith & Co.,  
Heating Contractors,  
Phila.

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Entered according to Act of Congress in the year 1896, by Warren Webster & Co.

# WARREN WEBSTER & CO.,

Exhaust Steam Specialists,

MAIN OFFICE AND WORKS,

CAMDEN, N. J.

---

## BRANCHES:

1504 MONADNOCK BUILDING,  
Chicago, Ill.

39 CORTLANDT STREET,  
New York.

## AGENCIES:

Boston,	San Francisco,	Denver,	New Orleans,	Minneapolis,
Pittsburg,	Dallas, Texas,	Cincinnati,	Baltimore,	Providence,
Harrisburg,	Atlanta,	Buffalo,	Cleveland,	Montreal, Canada.

*Long Distance Telephone Call—323, Camden, N. J.*

*Cable Address—"Delphic"—Camden, N. J.*